Summary of Results from

NDIA Simulation-Based Acquisition Conference
"Acquisition in the 21st Century"

**Presentation to the
Acquisition Functional Area Council
11 July 2001**

Purpose of this Package

- NDIA Workshop "Acquisition in the 21st Century" was held in May 2001
  - **3rd OSD Simulation Based Acquisition (SBA) Conference**
- Over 225 participants from industry, government and academia
- Organized around key areas which contribute to the effective use of simulation to support acquisition: "Enabler Classes"
  - **Integrated the range of relevant activities underway across the DOD from policy to technical standards to specific capability developments**
- Conference presentations, questions and answers and follow-up discussions have led to a set of observations and conclusions
  - **These are being used as a basis for development of a set of follow-on recommendations**

SBA

Conference Observations (1)

- Acceptance of SBA Concepts
  - **Simulation based acquisition concepts are becoming more widespread and accepted by selected programs, Services, and agencies as experience builds on benefits of addressing issues early in the life cycle in simulation**
- Community Consensus on SBA Definition and Key Enablers
  - **Industry and government have adopted a common definition of an SBA vision and definition to guide their respective actions**
  - **Enabler framework has been created to assist community in assessing the state of play in various related areas and initiatives which address underpinnings to SBA success**

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Conference Observations (2)

- Policy
  - **New acquisition regulations reflect increased emphasis on use of modeling and simulation through system development life cycle**
  - **Also reflect increasing emphasis on systems of systems and interoperability**

- Interoperability
  - **If interoperability is to be achieved effectively and efficiently, simulation environments supporting development of one system need to be reusable across related systems, and with both fielded systems and systems at different stages in the development process**
  - **These prerequisites to development of interoperable systems are key aspects of SBA**

Conference Observations (3)

- Implementation Progress
  - **Key programs, notably Joint Strike Fighter, offer a maturing example of how SBA concepts can materially aid system development, as the program moves into EMD following an acquisition strategy with simulation at its heart**
  - **Development of new systems, notably the Army Future Combat system development (key to Army transformation) is critically dependent on the use of simulation throughout the life cycle**
  - **Critical mission areas, notably missile defense, have integrated M&S into the fabric of the development process, with clear benefits from consistent, persistent, focused investment**
  - **Achievement of new missions, notably AF C2 integration, is based on a strategy dependent on reliable, authoritative simulation environments**
  - **Enterprise investments in the Joint Distributed Engineering Plant will support developers in system of systems interoperability through access to hardware in the loop and simulation capabilities**

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Conference Observations (4)

- Implementation Progress
  - **Resulting from program and Service initiatives, there is a growing suite of collaborative simulation environments in active use or development today, including:**
    - **Virtual Strike Warfare Environment : Joint Strike Fighter**
    - **Joint Synthetic Battlespace (JSB): AF C2 Integration,**
    - **Joint Virtual Battlespace and Army RDEC Federation: Army Future Combat Systems Development**

  - **These environments are built using industry standards (HLA/IEEE1516) for simulation interoperability, and emerging DoD standards for range and HWIL interoperability and reuse (TENA), providing a basis for extension and easy partnerships with industry**

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Conference Observations (5)

- There is a need for system representations, both friendly and threat, for use by multiple programs; however, simulations of systems are generally not readily available nor is the information needed to create these representations

- Information sharing is important to making shared environments a reality; however, while the technology for information exchange is readily available from commercial industry, the technology is applied in different ways in different programs and Services and the limited information offered for community sharing is an obstacle to progress

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Observations (6)

- Industry views (from Captains of Industry Panel)
  - **Industry sees value of SBA for themselves and for industry in partnership with government**
  - **Industry is making investment in SBA tools and capabilities for their own use**
  - **The uneven, fragmented approach to SBA across the DOD poses real problems for industry which tends to work across systems, Services, customers and industry alliances**
  - **Fragmentation of approach causes industry to make duplicative investments, and in general is diluting the real benefits SBA has to offer**
  - **Call for Government, DOD in particular, to pull together and create a common, consistent SBA strategy across the Services and programs**

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Current SBA Situation (1)

- SBA benefits are real and progress is significant, but it is uneven and stovepiped
  - **Some programs (JSF, AAV, Crusader) have moved out using robust simulation across program phases, but they are largely stand-alone efforts and struggle to establish needed external interfaces (e.g., authoritative data sources on C4ISR links and friendly systems)**
  - **There is no coherent cross-Service strategy to get us to the "across programs" and interoperability goals**
  - **For a variety of reasons, the majority of programs have not embraced SBA concepts**
  - **However, new programs are in most cases seriously assessing how to best apply SBA concepts to their processes**

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Current SBA Situation(2)

- Authoritative shared representations of elements which affect multiple systems is an area which needs serious attention
  - **Commonly needed representations needed a are now being developed by each initiative in different ways for their own local specific needs, even areas critical to multiple systems. These include friendly and threat system representations, C3 representations and environmental databases.**
  - **This adds to the cost and risk of use of simulation environments for both individual systems and families, undermining their value to the Department**
- Serious improvements in the mechanisms to locate and access authoritative information are also sorely needed
  - **When authoritative representations do exist, they are difficult to find and access, and hence tend not to be shared; nor is needed source information (raw material) readily available**

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Current SBA Situation(3)

- It's a crowded playing field.
  - **There is lots of activity in the product development/system acquisition domain**
    - **much of it under other initiatives inside the DOD, elsewhere in government (e.g. NIST), in universities (e.g., MIT) or in the broader commercial industry environment**
  - **Program manager "initiative fatigue" is significant**
  - **There is potential synergy among these activities, but there is no effective mechanism to realize this**

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Current SBA Situation(4)

- "No one [program] wants to buy the infrastructure" (RDEC federation quote)
  - **Developing the key cross-cutting enablers is being neglected within DoD**

  - **In part, the case for them hasn't been made clearly**
  - **Almost all the money is within individual acquisition programs, who have no motivation to be altruistic regarding larger Department needs**

- The SBA enabler framework is understood and endorsed as a means for getting at the issues necessary to implement SBA (or more generally, advanced acquisition environments)
  - **Framework provides a viable tool to support next steps**
  - **A systems engineering approach is needed to complete the framework and move to capability**

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Considerations for the Way Ahead (1)

- The need for one voice from DoD
  - **Services have moved out on key programs using collaborative, robust simulation within programs, but no coherent cross-Service strategy**
  - **Need for a more integrated approach across the numerous initiatives (IDE, CAIV, KM,..) that contribute to the SBA environment**
    - **Panel of Captains of Industry highlighted the impact on industry of fragmented approach and called for DOD action**
    - **Any new actions need to be sensitive to initiative fatigue on part of PMs**
- The need for an effective mechanism within the DoD to exercise that voice
  - **Need to retain a supported focal point in OSD working across the enterprise**
    - **Is the Acquisition Council the right forum for coordinated action? Many members have changed; Products have not been forthcoming**
  - **Services not waiting for OSD direction in these areas; OSD enterprise action needs to contribute to, not interfere with, ongoing efforts**

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Considerations for the Way Ahead (2)

- Systems engineering approach is necessary—need to identify areas in which to build the enablers, including
  - **Policy, organization, and process changes**
  - **Software tools**
  - **Authoritative information sources**
  - **Standards to support interoperability and reuse**
  - **Means to discover, obtain and protect reusable resources**
  - **Business case evidence**
  - **Means to educate, motivate and transform work force**
- Interoperability can provide a focus for developing the integrating framework for Advanced Acquisition
  - **Though many of the DoD and Service initiatives have specific actions, many of them have common goals and can be coordinated under one umbrella**
  - **Interoperability is a high priority which is dependent on effective shared simulation environments**

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Considerations for the Way Ahead (3)

- Key for any SBA initiative to be conducted in a broader integrating framework: Advanced Acquisition Environments

  - **Having 'acquisition' alone in the name may imply not including logistics, training, requirements,…**
  - **Framework can provide integration mechanism for initiatives, policies, and environments**
  - **In order to work, this activity cannot be comprised simply from the volunteers from industry and government—must be funded**
  - **An Industry Task Force must be associated with the OSD office to get buy-in**
  - **Must have buy-in from OSD and Service Acquisition leadership –not just M&S**

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